

PLATE XLV.

Fig. 1. Outer aspect of the right pelvic limb of *Geococcyx californianus* showing the third layer of deep muscles, with a dissecting-chain pulling the *ambiens* into view. Life size, by the author from his own dissections.

2. Outer aspect of pelvis and right pelvic limb of *Geococcyx californianus*. Designed to show the deep muscles of the region, and the bones have been slightly rotated from their normal positions in order to bring them into view. a. Vinculum between deep flexor and flexor *longus hallucis*. Drawn by the author from his own dissections.

3. Description of three Species of *Scelidotherium*.

By R. LYDEKKER, B.A., F.G.S., F.Z.S., &c.

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(Plates XLVI.—XLIX.)

In the 'Zoology of the Voyage of the Beagle,' published in 1840, Prof. Sir Richard Owen founded the genus *Scelidotherium* on the evidence of a considerable portion of the skeleton of a large megatheriid Edentate found by Darwin in the Pleistocene of Bahia Blanca, in Patagonia, and applied the specific name of *leptocephalum*. In the following year and in 1842, Lund published in the volumes of the Copenhagen Academy descriptions and figures of more or less imperfect remains of various allied animals from the Brazilian caves, all of which were eventually referred either to Owen's genus or to the new genus *Platyonyx*, no less than seven new specific names being applied to these specimens. In 1850 the late Prof. P. Gervais published, in the results of Castelnau's Voyage ('Mammifères fossiles de l'Amérique méridionale'), a description and figure of a skull from Buenos Ayres which he referred to the type species of *Scelidotherium*, and also of a second one from Tarija in Bolivia, which he did not name specifically but thought might be a new species. In 1857 Sir Richard Owen published a second memoir in the 'Philosophical Transactions,' in which he described and figured two skulls brought over in 1854 by Bravard from the Pleistocene of the Argentine Republic, both of which he referred to the type species. An important notice of the group was contributed by Dr. H. Burmeister, of Buenos Ayres, in his 'Description Physique de la République Argentine'¹ (1879), where he described a skeleton which he likewise referred to the type species, and also gave reasons for adopting Lund's genus *Platyonyx* for some of the allied forms. In 1880 Messrs. H. Gervais and Ameghino, in a memoir published under the title of 'Mammifères fossiles de l'Amérique méridionale,' gave a synopsis of all the previously named species of *Scelidotherium* and *Platyonyx*, and applied the new specific name of *S. tarijense* to the above-mentioned skull from Bolivia, figured by P. Gervais; and also founded a second

¹ Vol. i. part iii. pp. 322-345, pl. xiv. There is no copy of the Atlas in any of the London libraries.

new species, for which they proposed the name of *S. capellini*, on the evidence of a lower jaw from the Pleistocene of Buenos Ayres. In 1881 Dr. Burmeister published in the Monatsb. k. preuss. Ak. Wiss. (pp. 374-380) a description with figures of the manus, pes, and knee-joint of a skeleton of *Scelidotherium* from the Pleistocene of the Argentine Republic, which was referred to *S. leptcephalum*. In 1885 Dr. Fischer¹ described a skeleton lately acquired by the Paris Museum of Natural History, which he refers to *S. leptcephalum*; while in 1886 Señor Ameghino² has applied the new name of *Scelidotherium? bellulum* to a single tooth from Parana. Finally it may be observed that the so-called *Scelidotherium ankilosopum*, Bravard³, is the same as *Myiodon (Grypothorium) darwini*, Owen. Other memoirs of minor import, which need not be quoted here, have also been published.

It will be seen from the above that no less than eleven specific names have been applied to animals of this group; six of which are included by Messrs. Gervais and Ameghino, in the memoir cited, in *Scelidotherium*, while four are referred to *Platyonyx*, the eleventh being of later date. Among the seven included under the former genus, there is no difficulty in regard to accepting the typical *S. leptcephalum* and *S. tarijense*; *S. capellini*, however, as being founded on a specimen which has not yet been figured, must be regarded merely as a nominal species; while *S. minutum*, Lund, is apparently founded upon immature specimens, and *S. bellulum* upon a single unfigured tooth. With regard to *S. bucklandi* and *S. oweni* of Lund, the type specimens are so imperfect that they do not appear to me to afford characters of sufficient importance to enable other specimens to be identified with them; and I have therefore been compelled to ignore these names when considering the affinities of the specimens described below. Of the four so-called species ranged by Messrs. Gervais and Ameghino under *Platyonyx*, the only one that can be regarded as satisfactory is *P. brongniarti*, which is founded on a nearly complete skull. *P. cuvieri* is founded on a fragment of a mandible which does not afford more satisfactory characters than the one on which *S. bucklandi* is founded; while *P. blainvillei* and *P. agassizi* have been named on still more unsatisfactory evidence, and must certainly therefore be regarded as not of more than nominal value.

The object of the present communication is, first, to show that one of the specimens figured by Sir Richard Owen in the memoir in the 'Philosophical Transactions,' already cited, does not belong to *S. leptcephalum*, which also leads to the conclusion that the specimen described by Dr. Burmeister in his second memoir under the same name is likewise distinct; and, secondly, to describe a skull belonging to a series of specimens, from the Pleistocene of Chili, recently acquired by the British Museum. In the course of this paper it will be shown that there appears no reason for the retention

¹ Comptes Rendus, vol. ci. p. 1291 (1885).

² Bol. Ac. Nac. Cordoba, vol. ix. p. 184 (1886).

³ In P. Gervais's 'Zool. et Pal. Générales,' sér. i. p. 132 (1867-69).

of the so-called genus *Platyonyx*, which is either founded on a misidentification, or on characters which cannot be regarded as of more than specific value.

With these few words of introduction, the descriptive portion of the memoir may be commenced.

SCOLIDOTHERIUM LEPTOCEPHALUM, Owen.

The type species is represented in English collections by the imperfect type skeleton from Patagonia preserved in the Museum of the Royal College of Surgeons, and by two imperfect skeletons collected by Bravard in the Argentine Republic and preserved in the British Museum. The skull from the latter country, figured by P. Gervais in the 'Mammifères fossiles de l'Amérique méridionale' (Castelnau's Voyage), pl. xi. fig. 1, apparently also belongs to this species.

The type cranium is considerably damaged, but the two British-Museum crania (Nos. 37308 and 32995), taken together, exhibit nearly all the important features; the second of these specimens is figured from the lateral aspect by Sir R. Owen in the 'Philosophical Transactions' for 1857, pl. viii. fig. 1. In Plate XLVI. of the present memoir I have figured the former specimen, the occiput being restored from No. 32995. In the figured specimen the greater portion of the nasals is preserved, and its more important characters are as follows:—

The facial profile is strongly curved, and presents a well-marked frontal protuberance behind the orbit; the cranium is of moderate width, and the nasals of great relative length, being when complete at least equal to one half the total length of the frontal aspect of the cranium. In correlation with the elongated nasals the facial portion of the maxilla is lengthened, and a large portion of it appears on the frontal aspect. The lachrymal is not very prominent, and the aperture of its canal looks directly outwards. The anterior border of the zygomatic process of the maxilla is inclined backwards; the fronto-parietal ridges are widely separated, and the interdental portion of the palate is not excessively narrow.

The mandible associated with the figured cranium has an elongated symphysis, the portion in advance of the teeth being nearly twice the length of the whole dental series, and the superior border of the anterior portion of the ramus nearly straight.

The more important measurements of the figured skull are as follows:—

Length of broken nasals	0·270
Length of facial part of maxilla	0·170
Width of the two occipital condyles.	0·108
Length from condyle to last tooth	0·242
Length of dental series.	0·113
Length of mandibular symphysis	0·156
Interval between hinder border of symphysis and last tooth.	0·350
Interval between do. and first tooth.	0·050

The only other part of the skeleton to which I wish to call attention is the astragalus, and I have accordingly figured the type specimen in Plate XLIX. fig. 3. It will be seen from this figure that the external trochlear ridge for articulation with the tibia is not prominent, and scarcely projects above the level of the internal tuberosity. The astragalus (B.M. No. 37476) associated with the cranium No. 37308 exhibits precisely similar features, although it is of somewhat larger dimensions. This type of astragalus is very widely different from that of *Megatherium* (in which the external trochlear ridge is extremely prominent), and apparently indicates that the eversion of the foot was not so great as in that genus.

SCOLIDOTHERIUM BRAVARDI, n. sp.

This species is founded on an imperfect skeleton in the British Museum, brought by Bravard from the Argentine Republic, which presents features clearly showing that it cannot belong to the type species, to which it has hitherto been referred. The cranium (B.M. No. 37626), which lacks the whole of the dentition and the greater portion of the nasals, has been figured by Sir R. Owen in the 'Philosophical Transactions' for 1857, pl. viii. fig. 2, from the palatal aspect¹, and referred to the type species; an upper view is given in Plate XLVII. of the present memoir. It is extremely unfortunate that the nasals are wanting; but from the structure of the adjacent bones it can be shown that these bones were certainly much shorter than in *S. leptcephalum*, since in the first place the superior border of the facial portion of the maxilla forms a much shorter curve than in the latter, while if the nasals were of the same length as in that species they would have projected far in advance of the premaxillæ. That the nasals were of a shorter type is also evident from a comparison of the figure with that of *S. chiliense* (Plate XLVIII.), when it will be seen that the facial portion of the maxilla is not dissimilar in the two species. The whole cranium is, moreover, relatively narrower than in *S. leptcephalum*, and the frontal profile is quite straight; while only a narrow moiety of the facial portion of the maxilla appears on the frontal aspect; and the lachrymal is characterized by its extreme prominence, and the partially upward direction of the aperture of its canal. The anterior border of the zygomatic process of the maxilla is nearly vertical, while the fronto-parietal ridges are closely approximated, and the interdental portion of the palate (as is well shown in Sir R. Owen's figure) is of excessive narrowness. It will also be seen from the following table of dimensions that while the width of the occipital condyles is smaller than in *S. leptcephalum*, the interval between the condyles and the last tooth is considerably greater, which indicates a great difference in the relative proportions of the two crania. The premaxillæ are well developed.

In the mandible² associated with the cranium, while the length of

¹ The teeth have been introduced on one side in this figure.

² This specimen is figured by Owen, *op. cit.* pl. viii. figs. 4, 5, with the teeth restored; and apparently in pl. ix. figs. 2, 3, the specimen represented in fig. 2 being erroneously described as belonging to the upper jaw.

the symphysis is greater than in *S. leptocephalum*, the interval between the hinder border of the symphysis and the first tooth is very considerably less. The superior border of that portion of the mandible in advance of the teeth is moreover inclined strongly upwards.

The following dimensions may be compared with those of *S. leptocephalum* :—

Length of facial part of maxilla (about)	0·135
Width of the two occipital condyles	0·095
Length from condyle to last tooth	0·258
Length of upper dental series	0·105
Length of mandibular symphysis	0·175
Interval between hinder border of symphysis and last tooth	0·350
Interval between do. and first tooth	0·032

I will now direct attention to the astragalus. Unfortunately the one specimen of this bone, associated with the cranium, is imperfect, although sufficient remains to show that it differs from the corresponding bone of the type species by the great prominence of the external trochlear ridge, which projects far above the level of the internal tuberosity. In Plate XLIX. fig. 4, there is represented an astragalus from a cavern in Brazil, which, although of larger size than Bravard's specimen, agrees precisely in structure, and either belongs to a male of the present form or to an allied species; and I think a comparison of this figure with that of the astragalus of *S. leptocephalum* will leave no doubt as to the specific distinctness of the two forms. This astragalus agrees precisely with the corresponding bone of a hind foot belonging to a perfect skeleton figured by Dr. Burmeister in the Monatsb. k. preuss. Ak. Wiss. for 1881, plate facing p. 380, fig. 2, and referred (on the authority of Sir R. Owen's figure of the cranium of the present form) to a large male of *S. leptocephalum*. A tibia from Brazil, associated with the figured astragalus, presents a structure of its distal surface modified to accord with this peculiar articulation, which is different from that of the tibia of *S. leptocephalum*; and there are equally well-marked differences in some of the other bones of the present form to which I shall allude on another occasion.

Whether or no the larger bones mentioned above belong to male individuals of the same species as the cranium, I think sufficient evidence has been adduced to show that both the form to which the latter and that to which the former belonged are specifically distinct from *S. leptocephalum*.

Confining, however, attention to Bravard's specimen, it is quite evident that this form is distinct both from *S. tarijense* (in which the mandible is of quite a different type) and *S. (Platyonyx) brongniarti* (in which the nasals are very short and the premaxillæ aborted); and since it appears impossible to identify it with either of the ill-defined Brazilian forms mentioned above to which specific names have been assigned, I propose that it should be known as

S. bravardi. Should, however, any of my fellow workers be able to identify it with either of such forms, I shall be only too happy to relegate this name to the rank of a synonym.

The structure of the astragalus of *S. bravardi* (as Dr. Burmeister remarks in his description of the larger form which I provisionally associate) approximates very strongly to that of *Megatherium*, although wanting the articular cup for the navicular; and it is therefore probable that the hind foot of this species was more everted than in *S. leptocephalum*. The shorter nasals of the present species also diverge less widely from the *Megatherium* type than do those of the last-named species, and this character is still more developed in the following form.

SCOLIDOTHERIUM CHILIENSE, n. sp.

The form to which I propose to apply the above name is represented by a series of specimens purchased during the present year by the British Museum, from a gentleman residing at Lima, which were obtained from the Pleistocene of Tamarugal, in the district of Tarapaca in Chili¹. The specimens comprise three more or less imperfect crania, the anterior portion of a mandible, and a considerable number of vertebræ and limb-bones. All that I have to say in regard to the limb-bones is, that the astragalus is intermediate in structure between that of *S. leptocephalum* and that of *S. bravardi*, and that the humerus has a well-defined entepicondylar foramen.

The least imperfect of the three crania is represented in Plate XLVIII., and shows nearly the whole of the nasals. The most striking feature of this cranium is the extreme shortness and breadth of the latter bones—their length not exceeding one third of the total length of the cranium—while the mandibular symphysis is also equally short, as will be seen by the following measurements. That this form is totally distinct from *S. leptocephalum* is self-evident. It appears more nearly allied to *S. bravardi*, with which it agrees in the prominence of the lachrymal, the narrowness of that portion of the maxilla appearing on the frontal aspect, the straight facial profile, and the narrowness of the interdental portion of the palate; but differs by its greater width, by the still shorter facial portion, by the probable abortion (as will be shown below) of the premaxillæ, and by the shorter anterior portion and symphysis of the mandible. The mandible is quite unlike that of *S. tarijense*², in which the symphyseal part is bent upwards very suddenly, nearly the whole of it being above the level of the dental alveoli. The nasals of that species are also much longer than those of the present form.

With the skull of the so-called *Platyonyx brongniarti* from Brazil, figured by Lund in the K. Danske Vid. Selsk. Skr. vol. ix. pl. xxviii., the present specimens agree very closely in general characters; but in addition to being of superior size, the cranium is relatively narrower, and lacks the marked expansion behind the nasals, while

¹ See map, *suprà*, p. 396.

² I refer to this species a left mandibular ramus from Brazil in the British Museum (No. 18649 a).

the nasals themselves are more pointed posteriorly and wider anteriorly, the width of the anterior expansion being greater than that at the frontal expansion, while the reverse condition obtains in *S. brongniarti*. The resemblance between the two crania is, however, sufficiently close to render it probable that the two forms were closely allied, and that the premaxillæ of the present form were similarly aborted. The dimensions of the present form are as follows:—

Length of the facial portion of maxilla	0·122
Width of the two occipital condyles	0·099
Length from condyles to last tooth	0·238
Length of upper dental series	0·093
Length of mandibular symphysis	0·124
Interval between hinder border of symphysis and first tooth	0·012

Since the present form is decidedly distinct from all the species mentioned above, and since I cannot identify it with either of the other ill-defined forms referred to *Scelidothierium* and *Platyonyx*, I can only adopt the course followed in the case of the preceding species; and I accordingly propose to designate this form as *Scelidothierium chiliense*, since I shall immediately show that the genus *Platyonyx* ought to be merged in *Scelidothierium*.

Platyonyx is stated by Lund (and his view is followed by Dr. Burmeister¹) to be distinguished from *Scelidothierium* by the absence of an entepicondylar foramen to the humerus, and by the more flattened phalangeals; while, according to Messrs. H. Gervais and Ameghino², the crochet of the last lower tooth is more prominent. Sir R. Owen³, who unites the two genera, is of opinion that the limb-bones referred by Lund to *Platyonyx* really belong to *Glyptodon*. I have no means of deciding which of these two views is correct; but the close general resemblance in the structure of the nasals of *Scelidothierium chiliense* to those of the so-called *Platyonyx brongniarti* leads me to conclude that whether the humerus of the latter was, or was not, provided with an entepicondylar foramen, the species is not entitled to generic distinction from *Scelidothierium*, the alleged differences in the structure of the phalangeals and of the last lower tooth being characters which are certainly not more than specific ones.

Taking the three species, *S. leptocephalum*, *S. bravardi*, and *S. chiliense* together, it will be seen that they form a sequence as here placed in regard to the length of the nasals—*S. chiliense* (together with *S. brongniarti*) being the least, and *S. leptocephalum* the most removed from the type of cranium obtaining in *Megatherium*.

Affinities of the Genus.

In conclusion, I may observe that *Scelidothierium* appears to be a

¹ Monatsb. k. preuss. Ak. Wiss. 1881, pp. 374–380.

² 'Mammifères fossiles de l'Amérique méridionale,' p. 151 (1880).

³ Memoir on the *Myiodon*, p. 170, note.

genus occupying in some respects an intermediate position between *Megatherium* and *Mylodon*, but also showing evidence of a still more widely extended affinity. The dentition is decidedly nearest to that of *Mylodon*, while the hind foot approximates to that of *Megatherium*. The crania of species like *S. chilense* and *S. bravardi* are those least removed from the *Megatherium* type, and it is these species which come nearest to that genus in the structure of the astragalus. All those forms in which the pes is known exhibit the ankylosis of the first and second phalangeals of the third digit, and the large claw of the same, which are such characteristic features of the type genus of the family. The peculiar *Mylodon darwini* (generically separated by Reinhardt under the name of *Grypotherium*) is the form by which *Scolidotherium* is connected by cranial characters with *Mylodon*; and the connection is so close that it becomes somewhat difficult to give a clear differential diagnosis. In its extremely elongated facial region and peculiar astragalus, *S. leptocephalum* is the species departing most widely from the *Megatherium* type, and it is probable, from the structure of the last-named bone, that in this animal the pes was not everted as it is in *Megatherium*. In both its peculiar features *S. leptocephalum* makes such a very marked approach to the *Myrmecophagidæ*, that it is quite easy to imagine how that family may have taken origin from some member of the *Megatheriidae*; while the remarkable resemblance in dental characters existing between those members of the genus *Mylodon* which have been separated by some writers under the names of *Pseudolestodon* and *Lestodon* and the *Bradypodidæ* suggests that the modern arboreal Sloths may also originally have sprung from some early member of the same great family of Ground-Sloths.

EXPLANATION OF THE PLATES.

PLATE XLVI.

Scolidotherium leptocephalum, Owen. Frontal aspect of the cranium; from the Argentine Republic. British Museum, No. 37308. The occiput has been restored from another specimen. $\frac{1}{3}$. *la*, lachrymal; *na*, nasal; *ma*, maxilla.

PLATE XLVII.

Scolidotherium bravardi, Lydekker. Frontal aspect of the imperfect cranium; from the Argentine Republic. British Museum, No. 37626. $\frac{1}{3}$. Letters as in Plate XLVI.

PLATE XLVIII.

Scolidotherium chilense, Lydekker. Frontal aspect of the cranium. British Museum, No. M. 2819. $\frac{1}{3}$. Letters as in Plate XLVI.

PLATE XLIX.

- Fig. 1. *Scolidotherium bravardi*, Lydekker. The mandible associated with the cranium figured in Plate XLVII. British Museum, No. 37649. $\frac{1}{3}$.
2. *Scolidotherium chilense*, Lydekker. The anterior part of the mandible; from Chili. British Museum, No. M. 2821. $\frac{1}{3}$.
3. *Scolidotherium leptocephalum*, Owen. The left astragalus; from Patagonia. Mus. Roy. Coll. Surgeons, No. 3520. $\frac{1}{3}$. *a*, external trochlear ridge for tibia; *b*, internal tuberosity.
4. (?) *Scolidotherium bravardi*, Lydekker. The left astragalus; from Brazil. British Museum, No. 18620 *k*. $\frac{1}{3}$. Letters as in fig. 3.